

U.S. Patent Application Serial No. **09/669,448**

Amendment dated November 12, 2003

Reply to OA of **May 23, 2003**

REMARKS

Claims 1-7 and 9-16 are pending in this application, with claims 9-16 withdrawn from consideration. Claims 1 and 2 have been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **May 23, 2003**.

Claim Objections

Claim 2 is objected to because of informalities. Taking the Examiner's comments into consideration, claim 2 has been amended. Thus, reconsideration and withdrawal of the objection of these claims are respectfully requested.

Claim Rejections under 35 USC §112

Claims 1 and 2 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Specifically, the Examiner asserts that "this order" lacks antecedent basis and is indefinite. Applicants have amended these claims, in accordance with the Examiner's suggestions. Therefore, withdrawal of the rejection of Claims 1 and 2 under 35 USC §112, second paragraph, is respectfully requested.

U.S. Patent Application Serial No. **09/669,448**
Amendment dated November 12, 2003
Reply to OA of **May 23, 2003**

Claim Rejections under 35 USC §103

Claims 1, 4 and 5 are rejected under 35 USC §103(a) as being unpatentable over Kidoguchi et al. (U.S. Patent No. 6,118,800) in view of Okajima et al. (U.S. Patent No. 5,065,404).

Kidoguchi et al. describes a semiconductor laser having among many layers a saturable absorbing layer (706), a current blocking layer (711), a third p-type cladding layer (705c), a contact layer (710), a cap layer (712), a p electrode (713) and a n electrode (714). A second cladding layer (1007) is 0.4 μm and a current blocking layer (1006) is 0.6 μm (See column 13, lines 35-37). Therefore the distance between the emission layer and the current blocking layer is $0.275/(1-(0.6-0.4))$ which is $0.344\mu\text{m}$ which is less than the first p-type cladding layer (1004) 0.15 μm as shown in table 2. As illustrated in figure 13, the first p-type cladding layer (1004) is located between the multiple quantum well active layer (1003) (Emission layer) and the current blocking layer (1006).

Okajima et al. describes in figure 1 a ridge portion is at a 90 degree angle to the substrate.

The present invention is semiconductor laser device having a substrate (1), a first cladding layer (10), an emission layer (100), a second cladding layer (12) and a first current blocking layer (14). The angle of inclination of the side surface for the ridge portion is between 70 degrees and 117 degrees. The distance t between the emission layer and the current blocking layer is determined by the relationship of $t \leq 0.275/(1 - (X_2 - X_1))$. The lower width of the ridge is between 2 and 5 μm . The distance t is composed of a n-type carrier blocking layer and a p-type first cladding layer.

U.S. Patent Application Serial No. 09/669,448
Amendment dated November 12, 2003
Reply to OA of May 23, 2003

Independent claim 1, as amended, recites that the distance t is composed of a second conductivity type cladding layer and the thickness of a carrier blocking layer. Accordingly, claim 1 and the claims dependent therefrom are patentably distinguishable over the cited reference.

Specifically, claim 1 patentably distinguishes over the prior art relied upon by reciting,

“A semiconductor laser device comprising: a substrate; a first conductivity type cladding layer; an emission layer; a second conductivity type carrier blocking layer; a second conductivity type cladding layer containing Al as a group III element and formed with a ridge portion; a current blocking layer, formed on said second conductivity type cladding layer around said ridge portion, containing Al as a group III element, wherein an angle θ of inclination on a side surface of said ridge portion with respect to an upper surface of said substrate is at least 70° and not more than 117° , a distance t between said emission layer and said current blocking layer satisfies a relation of $t \leq 0.275/(1 - (X_2 - X_1))$ micrometer assuming that X_1 represents a composition ratio of Al in group III elements forming said second conductivity type cladding layer, X_2 represents a composition ratio of Al in group III elements forming said current blocking layer, wherein said distance t includes the thickness of said second conductivity type cladding layer and the thickness of said carrier blocking layer, and a lower width W of said ridge portion is at least 2 μm and not more than 5 μm .” (Emphasis Added)

Therefore, withdrawal of the rejection of Claims 1, 4 and 5 under 35 USC §103(1) as being unpatentable over Kidoguchi et al. (U.S. Patent No. 6,118,800) in view of Okajima et al. (U.S. Patent No. 5,065,404) is respectfully requested.

Claims 2 and 3 are rejected under 35 USC §103(a) as being unpatentable over Kidoguchi et al. (U.S. Patent No. 6,118,800) in view of Okajima et al. (U.S. Patent No. 5,065,404) as applied to claim 1 above, and further in view of Goto et al. (U.S. Patent No. 5,608,752).

U.S. Patent Application Serial No. **09/669,448**
Amendment dated November 12, 2003
Reply to OA of **May 23, 2003**

Goto et al. describes a semiconductor laser having a first conductivity cladding layer and a ridge having a n-type cladding layer (3)

For similar reasons as discussed above for claim 1, claims 2 and 3 dependent therefrom also are patentably distinguishable over the cited references.

Therefore, withdrawal of the rejection of Claims 2 and 3 under 35 USC §103(a) as being unpatentable over Kidoguchi et al. (U.S. Patent No. 6,118,800) in view of Okajima et al. (U.S. Patent No. 5,065,404) as applied to claim 1 above, and further in view of Goto et al. (U.S. Patent No. 5,608,752) is respectfully requested.

Claim 7 is rejected under 35 USC §103(a) as being unpatentable over Kidoguchi et al. (U.S. Patent No. 6,118,800) in view of Okajima et al. (U.S. Patent No. 5,065,404) as applied to claim 1 above, and further in view of Narui et al. (U.S. Patent No. 6,404,790).

Narui et al. describes in the related art that the upper surface of the substrate is inclined by several degrees.

For similar reasons as discussed above for claim 1, claim 7 dependent therefrom also is patentably distinguishable over the cited references.

Therefore, withdrawal of the rejection of Claim 7 under 35 USC §103(a) as being unpatentable over Kidoguchi et al. (U.S. Patent No. 6,118,800) in view of Okajima et al. (U.S. Patent No. 5,065,404) as applied to claim 1 above, and further in view of Narui et al. (U.S. Patent No. 6,404,790) is respectfully requested.

Claims 1, 5 and 6 are rejected under 35 USC §103(a) as being unpatentable over Kawano

U.S. Patent Application Serial No. **09/669,448**
Amendment dated November 12, 2003
Reply to OA of **May 23, 2003**

(U.S. Patent NO. 5,065,402) in view of Okajima et al. (U.S. Patent No. 5,065,404).

Kawano describes a semiconductor laser having a current blocking layer (18) and an optical guide layer (15).

For similar reasons as discussed above for claim 1, claim 1 and claims 5 and 6 dependent therefrom also are patentably distinguishable over the cited references.

Therefore, withdrawal of the rejection of Claims 1, 5 and 6 under 35 USC §103(a) as being unpatentable over Kawano (U.S. Patent NO. 5,065,402) in view of Okajima et al. (U.S. Patent No. 5,065,404) is respectfully requested.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP



George N. Stevens
Attorney for Applicant
Reg. No. 36,938

GNS/x1
Atty. Docket No. **001241**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



23850
PATENT TRADEMARK OFFICE